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HEALTHY WORKER EFFECT AMONG EMPLOYED SWEDISH MEN AND WOMEN: CANCER INCIDENCE AND MORTALITY. G. Gridley,* T. Moradi, M. Dosemeci, H.O. Adami, H. Bath, O. Nyren, andS.H. Zahm (Division of Cancer Epidemiology and Genetics, National Cancer Institute, Rockville, MD 20892)

Healthy Worker Effect (HWE) is a potential bias in occupational studies that compare disease rates among employed people to disease rates among the general population, which includes unemployed, often less healthy, people. We evaluated whether HWE differs by disease measure (cancer mortality or incidence), gender, years of follow-up, urban residence, social class or age. We used Swedish censuses from 1960 and 1970 to identify 1,650,671 men and 550,235 women employed in both years. Complete follow-up during 1971-1989 was achieved through linkages to the national cancer and death registers. Standardized Incidence Ratios (SIR) and Standardized Mortality Ratios (SMR) were computed using for comparison all men (724,701) and women (1,634,621) who were not employed in either 1960 nor 1970. In general, SMR were decreased more than SIR, and for more cancer sites. Decreased SMR were observed for total cancer (SMR = 0.82) among men, but only in the early years of follow-up among women (SMR = 0.91). Both SMR and SIR were markedly decreased for non-urban residence compared to urban residence among both men and women. Different cancer sites were decreased depending on gender, social class and age. Our results show that HWE may operate differently for cancer mortality and incidence, for specific cancers, and in different subgroups of the employed population.

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CIGARETTE SMOKING PREVALENCE BY OCCUPATION AND INDUSTRY IN THE UNITED STATES. K.M. Bang* and J.H. Kim (National Institute for Occupational Safety and Health, CDC, Morgantown, WV 26505)

This study was undertaken to estimate the most recent prevalence of cigarette smoking by occupation and industry in the United States, using the data from the Third National Health and Nutrition Examination Survey (NHANES III), 1988-1994. Included in NHANES III are data on the cigarette smoking status, occupation, industry, and other demographic information of U.S. noninstitutionalized civilians obtained through household interview surveys. The study population included 20,032 adults aged 17 years and older. To estimate the prevalence of cigarette smoking across occupation and industry groups, we used the Survey Data Analysis (SUDAAN) software which incorporates sample weights and non-response adjustment. The overall prevalence of cigarette smoking was 28.3% (95% CI = 26.9 -29.8). The prevalence of cigarette smoking was highest among blue-collar occupations including material moving occupations (45.9%, 95% CI = 35.7-56.1), construction laborers (41.9%, 95% CI = 31.5- 52.3), and vehicle mechanics and repairers (41.7%, 95% CI = 31.5- 52.3). The lowest smoking prevalence was found among teachers (12.2%, 95% CI = 8.5-15.9). Among industry groups, the construction industry had the highest prevalence of cigarette smoking (42.2%, 95% CI = 37.1-47.3), while educational services (14.4%, 95% CI = 11.1- 17.7) and offices of health practitioners (14.4%, 95% CI = 8.9-24.9). These findings provide information useful for targeting education activities focusing on adverse health effects of cigarette smoking and also for indirect adjustments in analysis of morbidity and mortality by occupation when direct measures of smoking prevalence are not available.

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EVALUATION OF A CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED) INTERVENTION IN REDUCING VIOLENCE IN LIQUOR STORES. C. Casteel,* C. Peek-Asa, and J.F. Kraus (University of California, Los Angeles, CA 90095)

Introduction. Liquor stores have the second highest occupational homicide rates in the U.S., the majority of which are robbery-related. Little is known about the risk factors for violence and prevention strategies to reduce these crimes. This study describes the risk factors for violence and examines the effectiveness of a CPTED program in reducing robberies and employee injuries in a small sample of liquor stores. Methods. Crime incidents occurring in Santa Monica, California liquor stores were collected between 1/1/92 - 7/1/98. Environmental surveys to assess crime risks were conducted in each participating store, and a CPTED intervention plan was provided. Twelve of 20 eligible stores participated. Pre- and post-intervention crime rates will be compared between intervention and control stores using an exact probability model for the data. Exact 95% confidence intervals will be computed for rate ratios. Mid-p-values to test the null of no difference between rates will be calculated. Results. Robberies accounted for 13% of all crimes reported to police by Santa Monica liquor stores; assaults accounted for 60%. The survey identified areas where CPTED controls could be effective: cash handling, lighting and visibility, access control, and crime control training. Conclusion. The CPTED model recognizes that crime can be minimized by controlling the physical environment. This survey found a number of robbery and injury risk conditions for which CPTED intervention components were both inexpensive and easy to implement. The effectiveness of the CPTED intervention and store compliance to CPTED recommendations will be available at the time of this presentation. This research is a pilot study for a large-scale intervention of workplace violence.

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THE "HEALTHY WORKER EFFECT" ON CANCER IN A LONG-TERM FOLLOW-UP COHORT. K. Koyama,* F. Kasagi, M. Yamada, and K. Mabuchi (Radiation Effects Research Foundation, Hiroshima, 732-0815, Japan)

The "healthy worker effect" and cancer risk was analyzed using long-term follow-up data with a retrospective cohort study design. The study cohort consisted of 2850 males aged 22-59 years, a sub-cohort of 19,961 Adult Health Study (AHS) subjects consisting of atomic bomb survivors in Hiroshima and Nagasaki. The AHS members have been invited to participate in biennial health examinations including clinical evaluations and routine laboratory assessments since 1958. The study cohort was divided into 3 groups: healthy; lightly abnormal; and abnormal, based on the clinical data examined between 1967 and 1969, then followed up from 1970 through 1994. The assumption was that the grouping of cohort members using the clinical data would mimic the selection of healthy persons (over not healthy persons) which may be operating at the time of employment. The rate ratios (RRs) for cancer incidence, cancer mortality, total mortality, and non-cancer mortality were calculated using the healthy group individuals as the reference category. For the bnormal group, RRs for cancer incidence and cancer mortality were 1.09 (95% confidence interval: 0.89-1.33) and 1.12 (0.85-1.46), respectively, indicating no significant differences in the future risks of cancer between ealthy and bnormal groups. In contrast, significantly elevated risks of total mortality and non-cancer mortality were observed for the abnormal group as the RRs were 1.65 (1.37-1.99) and 2.24 (1.72-2.93), respectively. For slightly abnormal group, similar future risks of all endpoints were also observed. If a healthy individual as defined in this study was assumed to be a healthy worker the data suggest that healthy worker effects might be exerted on total mortality, primarily reflecting the non-cancer mortality risk, but not on cancer incidence or mortality risks.